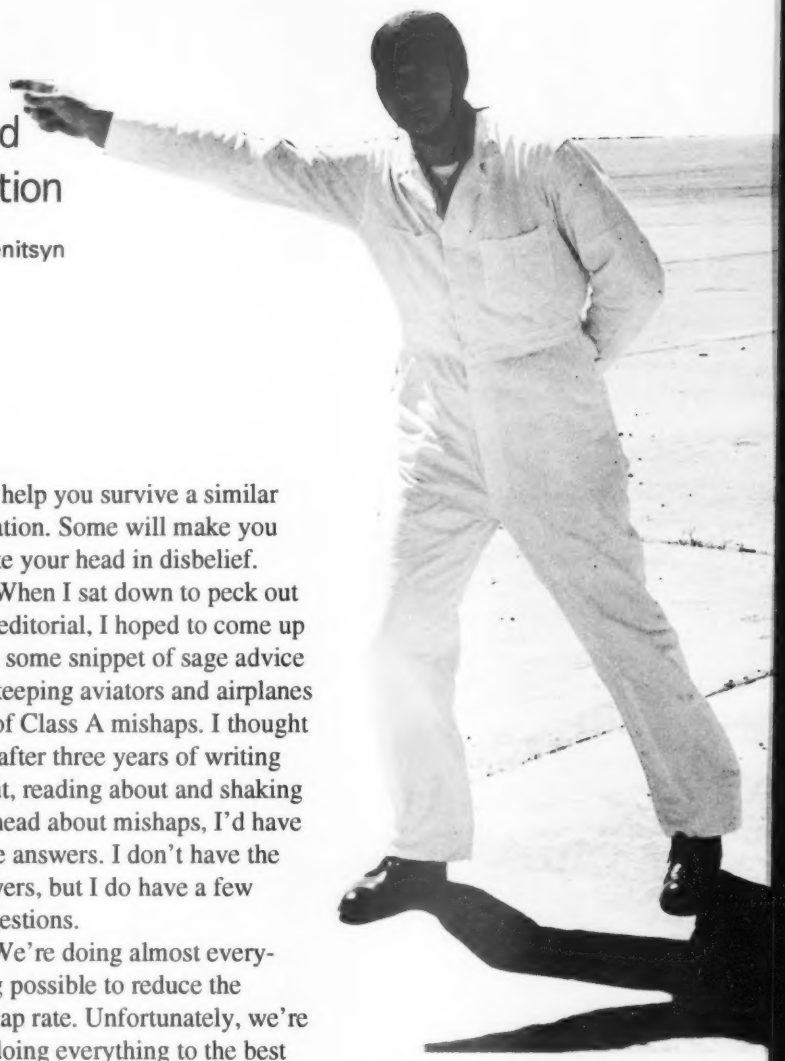
March 1994

approach

Class A Mishap Issue

"Literature transmits incontrovertible condensed experience... from generation to generation." Alexander Solzhenitsyn



Although *Approach* may not qualify as great literature, this quotation summarizes why we publish the magazine. We pass hard-won lessons from one generation of aviators to another. In this issue, my last as editor of *Approach*, we look at the pinnacle of experience — the Class A mishap.

I learned the most about my aircraft, and flying in general, sitting around the ready room listening to the verbal version of "I Witness Video." Those sessions cured the narcolepsy reading NATOPS can induce. They explained what would happen, in vivid terms, when the "secondary bypass breather valve induction gear" failed. You'll find that the next 17 pages of Class A mishaps are the reality behind the cliche that "NATOPS is written in blood."

Some of the mishaps in this issue were caused by aircrew error, some by material failure, others a combination of the two. Some will help you avoid the same or similar mistakes. Some will help you survive a similar situation. Some will make you shake your head in disbelief.

When I sat down to peck out this editorial, I hoped to come up with some snippet of sage advice for keeping aviators and airplanes out of Class A mishaps. I thought that after three years of writing about, reading about and shaking my head about mishaps, I'd have some answers. I don't have the answers, but I do have a few suggestions.

We're doing almost everything possible to reduce the mishap rate. Unfortunately, we're not doing everything to the best of our ability. Reduction of the mishap rate will come when we do everything a little better. Tougher NATOPS check flights, stricter adherence to instructions, truer qualifications (when you log a night trap, be sure it really is).

Some of you may feel you're doing these things already. Many of you probably are. Still, every day I get an article or read a mishap report where the human part of the system broke down. We have to depend on each other. No one person completes the mission, but any one person can end it.

Lt. Steven Halsted

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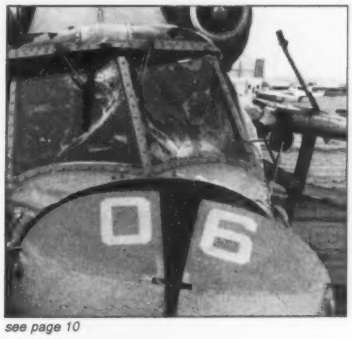
CLASS A MISHAPS

Correction:

Re: "SSC Becomes SAR" (Jan 94)

The VHF Guard frequency is 121.5 *not* 122.5.



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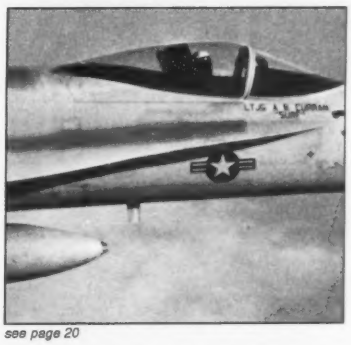

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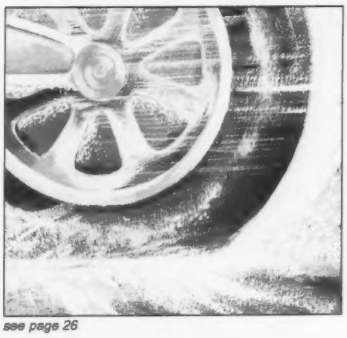

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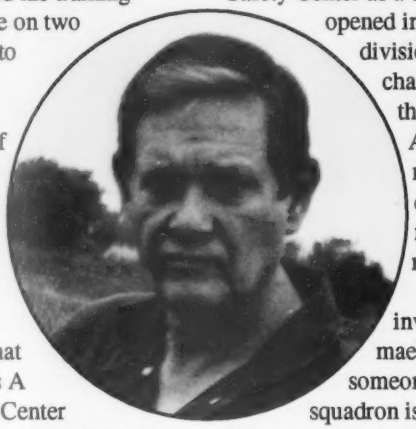
Believe It or Not!

One Man: 93 Class A Mishaps

By Derek Nelson

In August 1979, John Combs was on vacation with his family in Gettysburg, Pennsylvania, when he got an urgent phone call. A reservist A-4 pilot had taken off from Willow Grove and climbed to 300 feet. The aircraft's tail seemed to explode; the A-4 flipped over and smashed into a graveyard. Combs had to get there and find out why.

Combs, a former Navy helo pilot, was beginning his new career as an aircraft mishap investigator (or MI) at the Naval Safety Center. He had finished his training and had accompanied a senior colleague on two "trainer" investigations. It was his turn to respond. He was at the scene less than three hours later. What was left of the pilot's body was still in what was left of the cockpit. Full of fuel, the aircraft had exploded into tiny pieces of metal, strewn over a quarter of a mile of the cemetery. Nevertheless, the crucial piece of evidence — an unlocked fuel cap — wasn't hard to find.



Combs had embarked on a career that would take him to the scene of 93 Class A mishaps, the standing record for Safety Center investigators ("more than an air wing" was the description at his retirement lunch last December). When he packed up his office, one of the pictures hanging over his desk showed the stricken A-4 from Willow Grove.

His professional background suited him for the job. He flew Navy helos (H-3s and H-34s) on active duty for six years, then in reserves, eventually retiring as a lieutenant commander. He served as squadron safety officer several times and earned a reputation as a stickler for doing things by the book. "The maintenance people in the reserves always called me 'Downer,' because I was so strict about the rules," he says with a grin. "I always thought there was a right way and a wrong way," and little gray area in between. "I wasn't about to take a helo that wasn't right and take a chance on killing my crew. The maintenance guys would say, 'Oh, God, here comes 'Downer' Combs again; we're going to go through hell."

His father was a safety officer for a chemical company, and thanks to these influences and experiences, he didn't consider the job of safety officer as just a junior-varsity billet. "To me it was always a special job," he says.

In February 1967, he came to work at the Naval Safety Center as a civilian helicopter analyst. When a job opened in the command's accident investigation division, Combs says he jumped at the chance. The job would take him around the world, from the Philippines to Saudi Arabia and Colombia, from snowy mountains to the deserts of the American West to the top of a 2,800-foot mountain in a jungle during the monsoon season.

At the scene of a mishap, the investigator wades into an emotional maelstrom. "If it's a smoking hole and someone has been killed, the mood at the squadron is very somber," Combs explains. "They know it could have been them. If no lives are lost, there's almost a state of euphoria, but there's fear, too." Sometimes people feel guilty. How could the mishap have been prevented? "That happens when you get down close to causes," Combs says.

It takes a certain detachment to be an effective investigator, to poke through the blackened metal fragments and inconsistent testimony. Of the gory details and the autopsies, Combs says, "I was able to steel myself right away."

Objectivity is crucial. "We aren't the personal friends of the people involved, and we aren't prejudiced one way or another," he says. "We don't try to protect anyone." An aviator's posthumous reputation is less important than

Searching for the tiniest clues, investigators enlist the help of many people. Some investigations require coordination with foreign governments and military personnel, such as during this mishap in Spain.

figuring out what caused a mishap and how it could have been prevented.

Several lines of inquiry yield crucial information. "An accident isn't caused by one thing, but a number of things," Combs says. "In every accident I've worked, there are a whole host of things that, if you had changed one or more of them, it wouldn't have happened."

The wreckage is the most visible thing, but "we look at more than hardware," he explains. "We have to look at human factors, not just the pilot but the aircrew and maintenance people, too. We always go one hundred percent into the pilot's history, but sometimes not as deeply into the crew's history, the people who work on the aircraft and who send the aircrew out to fly. They can be just as much a factor.

The web of cause and effect stretches far away from the mishap site. Combs investigated one mishap where an aircraft crashed because a seal had not been placed in the engine correctly. "Those parts are signed for at the place they're repaired or worked on," he points out, making it possible to find the mechanic involved. "In this case, I found the man and talked to him."

"My daughter has been giving me hell," the mechanic explained. He told Combs that this domestic strife had made him switch to the night shift just so he could avoid having to go home and confront her. He had installed the seal that caused the mishap during his first night shift.

Paperwork is another source of clues. "I always go through the records — medical, quals — very carefully," he says. "The squadron has already done that, but they often miss things." For example, he once found a squadron executive officer (a BN) who had a medical "up" chit

dated six months earlier, signed by a doctor who hadn't been at the squadron for 18 months. "The XO had been falsifying the records," Combs recalls. "That didn't cause the accident, but it was a major problem." Investigators will often find several problems unrelated to the mishap that still help get rid of insidious hazards at the squadron.

As the pieces fall into place, an effective investigator must fight the urge to guess at what caused a mishap. A pertinent quotation from Sherlock Holmes stands above the entrance to the MI's offices: "'It is unwise, my dear Watson, to speculate in advance of the facts,' Holmes admonished. 'Invariably, it biases the judgment.'"

"I don't speculate — that will cloud your judgment sooner than anything," Combs insists. If you fall in love with a theory too early in an investigation, "you start trying to prove your idea," ignoring what doesn't fit. While interviewing witnesses or aircrew members about a mishap, the same attitude must prevail.

"You have to be careful about telling them what you think, because whatever you want to hear, they'll tell you. You have to be totally impassive."

During the investigation, Combs says, "only the senior board member can speak about causes, no one else. The board members can't even discuss it with their best buddies, because that's how rumors turn into facts and spread all over the country. And that can affect how the fleet flies." In rare instances, senior officers have prematurely grounded fleets.

Swamp land to desert, investigators go to where the mishaps are. Sites like the above are difficult to get to and often make it tough to find critical components.

The tangible results of investigations appear on what the MIs call the "Save Board," another item on the colorful walls of their office, which tabulates mishaps that were probably prevented. For example, when a helo crashed several years ago because the main drive shaft failed.The investigation revealed that the fleet had major problems; all helos of that type were grounded temporarily, and, Combs says, "we pushed it until we got authorization to replace every main drive shaft in the fleet, 131 of them." This massive program, scheduled to be complete in 1995, is underway now. Although these kinds of hardware fixes are expensive, they are at least straightforward and tangible. That doesn't mean they are always necessary.

"The urge to add new fixes and new procedures seems to be human nature. The squadron wants to say, 'Hey, these guys didn't die for nothing.' Someone shouldn't die because of some stupid-ass mistake." Combs pauses, briefly. "But sometimes that is the reason."

Is there such a thing as an "act of God," an unavoidable mishap? "No," he says, shaking his head slowly and decisively. "Every accident is caused by a human being or a group of people. Even a total material failure —maybe the part was designed wrong, or the inspections or maintenance weren't right. There is always a human failure somewhere."

MIs use the verb "solve" when they discuss investigations. Now that John Combs has solved his last one for the Navy, he is content. It was a long, colorful road that started by digging parts of a wrecked A-4 out of graves in a New Jersey cemetery, the kind of road the leads to great stories. Like the time he helped salvage an A-7 out of a body of water called Alligator Lake near a Navy bombing range ("We didn't see any 'gators," a fellow investigator recalled). Or the time a salvage crew chopped down some small trees and used them to support an A-6 engine while they carried it out of some woods near Emporia, Virginia (the Marines called Combs "Whip" after this episode).In spite of the interrupted vacations, the discontinued weekends, the spur-of-the-moment launches to random locations, he says, "I would not have chosen another place to work. The Safety Center was a very, very special place for me, and it has been an extraordinarily exciting and interesting career. Being able to have a job where I could find answers that would help make the Navy safer has been a privilege. I think about the number of young aviators whose lives I may have saved, and that feeling can never be replaced by anything else I will ever do."

Mr. Nelson is the Editor in Chief of the Media and Education Support Department at the Naval Safety Center.

Keeping the MIs Off Your Case

On behalf of the Navy, a mishap investigator has a serious responsibility toward Navy aviators: "We have to make sure that we don't kill them and we don't let them kill themselves," Combs says. Because the latter happens more often than the former, he offers a few ways to keep an MI off your case.

The first two pieces of advice are deceptively simple: "Don't break the rules and don't take shortcuts." In spite of the fact that the Navy's "standardization program has proven itself 100-fold, beyond the shadow of a doubt," Combs observes, many pilots have convinced themselves that, because they were so skillful or in such a hurry, the rules didn't apply.

Comb's third piece of guidance is to know the limits of your hardware. Flight training will teach you "how to get everything out of an aircraft," he says. "If you go beyond that one point, you're going to kill yourself and become a statistic." When it comes to observing those limits, "be strict with yourself."

Fourth, don't believe in the fudge factor. "There is no fudge factor built into the system for safety," Combs says. "I feel very strongly about that. I've seen too many who have fudged it and they are no longer with us."

In particular, he emphasizes, "Flathatting is a no-no." Combs readily recalls one case. On this pilot's first flight after being qualified as a flight lead, he decided to fly up a blind canyon. It was a brief one-way trip that ended in ejection. "The observer's parachute was melted by the fireball," Combs explains. "He died immediately. The pilot's parachute hung up on a cliff for a while, then he slid down into the fireball, too."

Finally, Combs says, assimilate the lessons of the past; listen and learn, read and heed. "About every five years, we seem to cycle through all the accidents again," he says. "There are very few new ones. Only the minor details change."

Wake Turbulence Killed This Pilot

By Lt. Brian Craddock

The flight was a logistics mission involving a Navy-leased twin-engine, high-winged, turboprop flying VFR as it approached a military ATA. Because of a variety of factors, the pilot became disoriented. He had difficulty communicating with Approach, and since radio frequencies were extremely busy, he switched to Tower without direction from Approach.

When he contacted Tower, the pilot said he was 15 miles northeast of the field. Actually, he was only eight miles away. Tower instructed him to report over the TACAN. The VORTAC was on an extended centerline 7.6 miles from the active runway's threshold. After almost 40 seconds, Tower again requested his position, and he again responded he was 15 NM to the northeast. He was now actually seven NM from the threshold. Without explanation, while in the final approach corridor, the pilot entered a high angle of bank, and made a 360-degree turn. Tower failed to identify or properly locate the aircraft on radar because of other aircraft that were actually 15 miles northeast of the field at that time.

Simultaneously, three F-16s were approaching the field. As the twin rolled out, its pilot fell in about 3.5 miles behind the lead F-16 and a half mile in front of the second. At this point, they were approximately six NM from the threshold, and the second F-16 was already cleared to land.

Upon intercepting the ILS glideslope and beginning a descent, the second F-16 overtook the twin and passed about 100 feet above and slightly to the left.

Almost 30 seconds later, the Navy pilot called Tower to say he was right behind the F-16. The pilot of the twin took no evasive action. He encountered wingtip vortices from the F-16 and entered an uncontrolled roll at a high rate. The aircraft hit the ground 2,600 feet short of the runway, killing the pilot and enlisted observer, and seriously injuring all seven passengers. The pilot of the F-16 landed unaware of the entire incident.

The pilot had enough time to take corrective action but failed to do so. Numerous variables and interesting problems contributed to this mishap, but the one that killed this pilot was his lack of understanding of wingtip vortices and wake turbulence. To understand how this mishap evolved, we should examine the manner in which ordinarily minor complications and errors interacted.

How did the pilot get lost? Several times he gave inaccurate position reports. He had tuned in the VORTAC in VOR 1 (this airplane has two VOR receivers and RNAV capability), which had a gripe on the DME; it didn't work on certain frequencies. Was this one of those frequencies? Why didn't he back it up?

...experience in one aircraft and type of flying does not necessarily translate into expertise in another.

In civilian life, this aircraft requires only a single pilot. Consequently, only one designated aviator was in the cockpit. The observer was actually an E-3 trained as an aircrewman. Did this create an authority barrier? Was the crewman aware of the problems with navigation, communication and traffic? Did he know how to avoid them? Would he have said anything if he had been aware?

Did the enlisted observer have the situational awareness to provide adequate assistance to the pilot? Would a more experienced aviator have made a difference? Aircrew coordination training directs a lot of discussion on authority gradients, leadership, communication and possible conflicts arising in multi-crewed cockpits. At a minimum, the presence of another officer would reduce the authority differential between the aircrew.

The squadron's standard operating procedure recommends an instrument approach if you are unfamiliar with an airfield. Records indicate the pilot was making his first trip to this field. He was on a VFR approach.

Communication problems developed with ATC. Numerous calls were not received or were garbled because of conflicting traffic and radio transmissions. The twin was equipped with VHF communications only. Many military aircraft have only UHF capability. Could communication have been improved if the twin was UHF capable? Would the pilot of the twin have had better situational awareness by being up on the same frequency as the F-16s?

Despite the complications that created the situation, the twin pilot could have saved the aircraft and his life if he had taken immediate evasive action. Wake turbulence and wingtip vortices are rarely lethal, but the potential always exists. Apparently, he did not completely comprehend the danger. How many aviators would? These topics are covered in elementary aerodynamics. Occasional pilot discussions or chance encounters in flight generally reinforce basic concepts. Sadly, many pilots fail to grasp or have long since forgotten the details.

(For more on wake turbulence, check the January 1994 issue and "Wake Turbulence and Vortices: Even the Small Ones Can Get You."—Ed.)

Numerous other topics are worth pointing out. Certainly the pilot's total time—1,500 hours—indicates a degree of experience. However, experience in one aircraft and type of flying does not necessarily translate into expertise in another. (He had just passed 100 hours in the twin.)

The navigation and communication equipment of tactical aircraft are usually quite different from the equipment found in a commercial transport. If the pilot had been more familiar and comfortable with the equipment on board, he might have established a back-up navigation source.

Also, why did the Navy pilot make a 360-degree turn on final? The logical conclusion is that the pilot was trying to correct his positioning error. Under no circumstances should this or any other unusual maneuver be made on final approach without telling ATC or Tower. To do so in a high angle of bank is even more reckless since this severely limits the field of view from the cockpit. Was he trying to avoid the embarrassment of admiting his error in reporting his position? Everyone knows a good aviator would rather die than look bad, right? Maybe if that old axiom died, so would fewer pilots! ◄

Lt. Craddock is a P-3 pilot and analyst for the Naval Safety Center.

Cobras and Hueys:
What Went Wrong?

By Maj. Ray Ferrara, USMC

LCdr. Lee Willis

Two Class A mishaps in late FY 1993 highlighted some major problems in the Huey and Cobra communities, which can exist in any other community. One flight ended in a midair during a photo mission, and the other was a crash in a desert canyon.

The photo mission, which had been approved by higher authority, included a Huey and a Cobra. A well-known civilian photographer (and a naval aviator in the reserves) would take photographs of the AH-1W from the UH-1N.

During the brief, the photographer said that he did not need the helicopters to fly close together because he would use telephoto lenses.

The two aircraft launched and entered the operating area. After completing the initial photo session, the Huey assumed TAC lead and headed for the refueling field. The Cobra flew formation on the Huey's port side – one to three rotor-diameters separation, abeam with a slightly forward bearing – with 0-10-foot step-down.

The Cobra HAC was flying from the rear seat. The crew had decided to fly a nonstandard, unbriefed, step-

down parade position. While flying in this formation, he looked inside the cockpit to check his engine instruments.

The Huey copilot, in the left seat, was reviewing his flight pubs, while the HAC flew the aircraft. The Huey crew chief was on the starboard side of the cabin with the photographer on the left. There was no qualified observer looking at either aircraft at this time. The two aircraft's main rotors collided, and both aircraft made emergency descents into the water.

Four of the six crewmen survived; the photographer and the Huey HAC were killed. The Cobra's canopy-removal system (CRS) didn't work properly, and all the survivors reported problems with their HEEDS.

The second mishap involved a flight of three UH-1Ns on an operational test-and-evaluation mission for light armored vehicle air defense (LAV-AD). Two helicopters would fly an electronic-warfare escort tracking mission, while the third would break off for a passenger lift.

The two Hueys flying the EW mission made several attacks from different positions. The pilots in the lead Huey pressed hard, flying very low and fast, and crashed. Four people died.

How are these two mishaps similar, and how could they have been prevented?

All the crewmen involved were qualified for flight and had completed aircrew coordination training (ACT). However, neither mission was listed in the *United States Marine Corps Training and Readiness Manual* as a perscribed training sortie. Both flights involved several aircraft and required extensive briefings for mission, tactical, section, and individual cockpit responsibilities. Both flights also involved a member of the mishap aircrew being late for the brief.

The copilot for the desert mishap was an AH-1W pilot, but he was the section leader and mission commander. The mission had been planned as an AH-1W hop, but because of a fleet grounding of AH-1Ws for main-rotor-blade inspection, the event was rescheduled for Hueys.

The aircrews, in both events, conducted briefs for mission, section and individual aircraft. However, the aircrews for the photo mission didn't brief the unauthorized, nonstandard, step-down close-abeam formation.

The briefing for the desert canyon flight did not include TERF requirements, although the FRAG would include TERF profiles. For some reason, the pilots of the mishap Huey did not brief the enlisted crewmen.

Low ceilings and poor visibility delayed the launch for the desert EW mission, and all three Hueys departed VFR, via a closed-field release. As the flight proceeded, the weather deteriorated. The crews returned to homeplate to await single-aircraft departures under IFR release.

The Hueys launched individually, canceled IFR, and rendezvoused VFR on top. Dash 1 and Dash 2 began their EW escort mission, with Dash 3 breaking off for its passenger lift.

For the desert mishap, both mishap pilots were qualified. The HAC was the squadron aviation safety officer. He was also an IP for TERF and tactics, as was the mission commander. Both enlisted crewmen had enough time in the aircraft to know their responsibilities. The mishap pilot was known to always consider his crew's comfort levels. Why, then, didn't he brief the crew on nap-of-the-earth (NOE) requirements? Why did he fly below NOE altitude and above NOE airspeed restrictions?

During the initial overflight and mission entry, the ground unit asked the mishap crew for a count of vehicles. The aircrew reported seeing only eight. The ground unit replied that 25 vehicles had been hidden. The Hueys then began their attack.

The mishap aircraft was being flown from the right seat in a left bank. The mishap pilot was flying cross-cockpit at about 10 feet AGL and between 40-60 knots. All the doors had been removed or opened to make it easier for the crew to see. Throughout the attack run, several ground observers reported never having seen a Huey or Cobra flown so fast or so low.

Both of these mishaps involved violating SOP and aircrew-coordination procedures. They also involved wingmen who saw the violations but did not say anything. Another problem was highly-skilled crewmen who were overconfident and overlooked critical sections of their briefs.

In both incidents, crew members should have questioned the briefing, inflight violations, and subsequent SOP violations.

Should we fault all involved for not speaking up? How about the ACT program? Where did it fail – or did it? Perhaps we need to make ACT more specific to aircraft missions and stress warning about violations. Do we need to train our enlisted aircrews more thoroughly about SOP violations and encourage questioning pilots' procedures? Finally, who would you report a violation to when the ASO is involved in the incident? ◄

Maj. Ferrara is the H-1/AH-1 analyst for the Naval Safety Center.

Flat Spin in a Helo

By Lt. Fred Sisk

It started out as the typical "good deal weekend" in a time of dwindling good deals. We were going to an air show sponsored by an antique warbirds museum. My copilot, aircrewman and I were ready for a fun cross-country.

The first leg of our flight plan was a VFR trip over the L.A. basin, through the San Gabriel Mountains to Meadows Field in Bakersfield. We had VMC all the way up, got some good overland nav training and even succeeded in avoiding all the local ARSAs and the L.A. TCA. We headed into our first fuel stop and were looking ahead to the short hop over to our destination after refueling.

We set up for a straight-in approach to landing with Tower calling winds variable at less than eight knots. I brought our SH-2F into a 15-foot hover over the airport's helo pad located on the displaced threshold, as my copilot discussed our taxi instructions with Tower. I started a slide to the right to move out of the way of the landing traffic.

In a matter of seconds, our world went from a stable hover to a violently spinning, pitching, and rolling, disorienting madhouse. We had lost tail-rotor thrust. The tail rotor came to an abrupt stop, allowing us to experience Newton's first law of physics in graphic detail. There was no time to stop and analyze the situation, other than to realize what was going on.

I won't say, "Time went into slow motion, and we deliberately performed the proper NATOPS memory items calmly and effectively," because to this day, I still remember only bits and pieces of the actual spinning and subsequent crash landing. Adrenaline and training took over as my copilot, and I fought through the procedures, secured the engines, and tried to cushion the landing. All those hours spent learning the EPs, drilling them into our minds, and using crew coordination saved our lives.

Once the spinning started (we estimated three or four turns at 75-90 deg/sec), my main concern was keeping the aircraft level and securing the engines to stop the rotation. This was hard because centrifugal force was trying to throw us out the windshield, causing us to hang forward in our harnesses.

My copilot straightened his back and placed his right hand over the engine-condition levers. On my call, he secured the engines, stopping the aircraft's rotation. Since the emergency started outside the "Dead Man's Curve," there was no chance for an autorotation and soft landing. Fortunately, I was able to maintain a level attitude and eliminate any drift so that we landed flat without rolling. Once on deck, I set the rotor brake to stop the main rotor and got out to check on my crewman.

The crash landing had collapsed one mainmount, sheared off the other and almost broke the tail section off.

The cabin height at the start of the flight was 4 feet, 8 inches, and collapsed to 3 feet.

The crash landing had collapsed one mainmount, sheared off the other and almost broke the tail section off. Our auxiliary fuel tanks were empty, and their fiberglass construction aided in cushioning the landing. The forward fuselage area, where I had to climb about three feet to enter the cockpit at the start of the flight, was now a mere foot off the ground. The cockpit stayed relatively intact, but my aircrewman in the cabin wasn't so lucky.

The SH-2F main gearbox is located directly above the sensor operator's head. It came down from the force of the crash, along with the radar rack that sits in front of him. His forethought to move his seat to the full aft position on final approach, not required by NATOPS, possibly saved his legs when the radar rack came to rest a few inches above the cabin decking. The cabin height at the start of the flight was 4 feet, 8 inches, and collapsed to 3 feet. The collapse of the cabin area gave my aircrewman the worst of the crew's injuries: three fractured vertebrae. Fortunately, we can all still walk, and my copilot and I were back on flight status two days later.

The mishap engineering inspection revealed that the retaining nut for the tail-rotor gearbox-output gear lost torque and backed off, allowing the output gear to lose mesh with the input pinion. Simply put, the gears went where they wanted, and we lost all tail-rotor drive without any warning.

There are some things I look back on and wish I could have done differently, but there are more things that I wouldn't. I knew the procedures for a loss of tail-rotor thrust in a hover like the back of my hand. In our case, it happened instantly and very violently. The entire mishap lasted about 15 seconds. Only our ingrained reactions allowed us to walk away.

Crew coordination was the other thing that kept us from becoming a statistic that day. My copilot and I each had more than 1,000 hours and were finishing up our first sea tours. We knew the airframe and the procedures intimately and were able to react as a team to fight the emergency. I was too busy trying to keep the aircraft level over one spot, and when my copilot looked back outside from securing the engines, he was instantly disoriented. If either of us had to perform both actions, we would have had drastically different results. ◀

Lt. Sisk flies with HSL-33.

Pinned

By Lt. Steven Halsted

How sure would you have to be that an aircraft would have a major failure before you would cancel a flight? In one squadron, at least nine people saw obvious indications of an impending engine malfunction. None took the right steps to prevent the mishap.

After a successful ACM hop, Sport 212 bounced slightly as the pilot applied the brakes. The plane captain tossed the chocks under the wheels and pinned the gear. Just before shutdown, the port engine began discharging gray smoke mixed with the exhaust. The plane captain notified power plants and QA to check out the problem.

After nearly 15 minutes, the trouble-shooters gave up. They couldn't find a reason for the smoke. The pilot shut down the engines, and the plane captain began the turnaround. Upon checking the oil in the port engine, an airman found no oil on the dipstick. He notified his supervisor, who told him to fill it up. The engine was 15 quarts low. No MAF was written.

More people became involved. Several AAs, an AE3, an AD1, an ATC and an AMCS all discussed the situation. For some unknown reason, none of them checked the F-14A Powerplant Testing and Trouble-shooting manual. If they had, they would have found that, based on the previous flight, the aircraft had consumed 10 times the acceptable amount of oil—a situation that recommended an engine change.

After a 20-minute low-power turn and a diagnosis (based on several people's experience) of a stuck oil breather, maintenance control marked the aircraft safe for flight.

The next day the RIO for Sport 212 walked in to maintenance control to read the ADB. The chief told him about the possible oil-breather malfunction and engine-oil loss. The chief didn't mention the quantity.

After the second 2 v 2 engagement, Sport 212 was in a slight climb, wings level, 320 knots, when the crew felt and heard a thump from the rear of the aircraft.

RIO (ICS): "Wooo, what was that?"

Pilot: "I don't know."

RIO (UHF): "We're having some compressor stalls. Weeble, can you come look at us?"

Pilot (ICS): "Left engine stall. OK, it looks like it's cleared... nope. Let's start

heading back towards the field if it's the left one."

RIO (UHF): "Left engine has stalled a couple of times now, and it's not clearing. We're heading back to the field."

Wingman (UHF): "Do you want me to go with you?"

RIO (UHF): "Yeah, why don't you give us a quick visual. We're on the 300 for 53 miles in a right turn."

Pilot (ICS): "I'm shutting down the left."

RIO (UHF): "Shutting down the left engine right now."

Pilot (ICS): "I don't know if I should start it or not. It was not pilot-induced."

RIO (ICS): "Continue your right turn to about 130 degrees. If you get a chance and feel comfortable…"

Pilot (ICS): "I'll go ahead and start it.

We've got good airspeed, now. Air-start switch is on, coming around the horn, let's see what happens."

Although compressor stalls are considered an emergency, they are so common in the TF-30 engine that crews have come to treat them casually, which would explain the crew's calm, almost matter-of-fact ICS and UHF communications.

Sport 212's wingman called FACSFAC, declared an emergency, and asked control to coordinate with homeplate. Control instructed Sport to squawk emergency, head inbound and standby.

The second attempt for a relight was unsuccessful. Sport 212 told his wingman that the engine wouldn't relight and that they were switching to Approach. Seconds later things got worse. The following dialogue took place on ICS.

Pilot: "Combined pressure zero."

RIO: "OK… combined pressure, what?"

Pilot: "Zero"

RIO: "OK, BIDI secured?"

Pilot: "Yes"

For the next 30 seconds there were no comms, inside or outside the aircraft. Unknown to the aircrew, the engine was coming apart because of FOD that had been left inside after a depot-level overhaul. The resulting fire melted the flight control rods. (Why the fire warning system malfunctioned is unknown.) The aircraft was unrecoverable almost immediately. The next communication was from the wingman.

Wingman (UHF): "You guys OK?"

Pilot (ICS): "Let's get out, Milo. Get out!"

The aircraft departed violently. Both the pilot and the RIO were immediately pinned to the canopy by the negative G. During ACM, crews fly with harnesses unlocked to allow adequate movement and lookout. Since the F-14 seat does not have a power wheel or other device to pull the crew back into their seat, many controls, including the ejection handles, are unreachable during negative G.

The pilot called for ejection and got no response from his RIO. (The RIO couldn't communicate because his feet could not reach the ICS and UHF floor switches and his mask was sliding off his face.) Still pinned against the upper left side of the canopy, the pilot reached for the lower handle. Using all his strength, he pushed and stretched to get a grip on the handle. His fingertips felt the top of it. With one final push he got a hold of the handle and pulled.

The RIO heard the call to get out and was also reaching for a handle. He couldn't reach the lower handle, and he couldn't get to the face curtain because he was so high in the seat. He felt the radar controls with his right hand when he heard the canopy go. He was then going up the rails.

Although they were in horrible positions for ejection, neither crewman was injured. Less than 50 minutes after ejection, both were aboard the helo and headed for the beach. Both were back on flight status within days.

This mishap raised many questions in the F-14 community, but the most important lesson applies to all who fly or maintain aircraft. It is never acceptable to circumvent procedures, and anyone who does must be reported.

Of all the people who knew of this aircraft's discrepancies, only a plane captain trainee made the proper deduction. When he informed his supervisor that the engine should be changed, he was ignored. Several very experienced mechs relied on "unofficial" procedures and well-known "F-14 lore" to troubleshoot a problem that was indicating imminent engine failure.

When the troubleshooters couldn't find a leak to explain the oil loss, the mechs made the error that sealed this aircraft's fate. They did not write a VID/MAF. Although it can't be proved, had the aircrew been aware of the volume of oil loss (10 times the allowable oil consumption according to NATOPS), they may have downed the aircraft.

Once again, we are presented with a mishap that was completely preventable. A conspiracy of experience, lack of communication, and improper (although community accepted) procedures led to the loss of an airplane. ➤

Lt. Halsted is the editor of *Approach*.

Tasking Is Now Complete!

By LCdr. Barry Westerwick

After assuming the E-2C/C-2A analyst's job at the Naval Safety Center, I decided to read up on some old mishaps, stuff that "happened way back when." Out of the 30-odd writeups I perused, one stuck out more than the others. It happened nearly 20 years ago, when I was a senior in high school, growing up near Miramar. Reading through the MIR, I was amazed, shocked and surprised. "How could this happen?" I thought. Maybe you'll agree.

An experienced E-2B aircraft commander, a lieutenant commander with 4,686 hours (1,300 in type), was sitting in the right seat of a cross-country instrument nav hop. His copilot had 3,100 hours but had only minimum experience in type (14 hours). Before departure from NAS East Coast for the return trip to NAS West Coast, the copilot had submitted an ETE to the aircraft commander, based on no-wind conditions. The aircraft commander accepted the ETE without verification. If he had checked it, he would have found that there was a 35-40 mph headwind component. He was planning to "figure in the wind later." They launched. During the flight, the crew didn't keep a fuel ladder.

The first leg was uneventful, picking up two crew members at the first intermediate stop, where they had dropped them off earlier. At the second intermediate stop, they picked up a third passenger, a squadron NFO.

After picking up the third passenger, the crew started the third leg to NAS West Coast, with a 40-minute flight to their next stop. Eighteen minutes into the flight, a low-fuel light illuminated on the master-caution panel. The pilot actuated the tank interconnect until the low-fuel light extinguished and continued the flight. He ignored a current NATOPS warning, which said that the fuel gauges are unreliable and the fuel-caution lights, when illuminated, are the primary indicators. The fuel gauges were actually showing the correct amount of fuel on board.

The NFO who boarded the aircraft asked how the fuel was going and was told that "it was going to be close," but there was no problem. The copilot recommended diverting for fuel, but the pilot didn't want to (alternate fields didn't have the right facilities). Still, the crew pressed on.

This was not the first time that the pilot had made a cross-country flight. As a matter of fact, he had been averaging one cross-country a month, possibly accounting

for his lack of concern over the then-unknown fuel crisis. Along the route, he had also never checked his aircraft's maximum range configuration, nor checked NATOPS for what was the correct configuration. He had gotten out the book to check, but never looked it up. He set the max-range configuration from memory, and, as a result, used the wrong flap setting, thus increasing fuel consumption by 10 percent and further decreasing their aircraft's range. They pressed on.

This story comes to a sudden end in a cornfield three-quarters of a mile from the approach end of the runway at an AFB. Minutes before impact, the pilot had declared minimum fuel and the copilot was still at the controls. Descending through 1,000 feet and while on short final, both generator lights came on, engine RPM decayed, and both engines flamed out from fuel starvation. The pilot took control of the aircraft, twice trying to relight the engines (unsuccessfully). The Hawkeye crashed, in landing configuration, in the cornfield, stopping after plowing a 200-foot shallow furrow in the field. The corn, fortunately, had already been harvested. No emergency call was ever made.

The pilot fractured his skull, broke his nose, and received a concussion. The copilot suffered a few cuts and bruises, and the passengers in the back egressed unscathed. The aircraft suffered $986,435 (in that year's dollars) worth of damage.

The pilot, a community golden boy, was considered stable and highly professional, and apparently enjoyed a good reputation within parts of the E-2 community. That's why his actions, at one level of the chain of command, seemed to be in diametric opposition to his reputation in the fleet. There was no known reason to suspect or predict the type of performance that led to the mishap.

Yet he was guilty of erroneous flight planning, poor en-route procedures, miscalculations of ground speeds, wrong configuration of the aircraft at the worst possible time, and most, glaringly, the apparent disregard of the crew's questioning of the fuel status...

In spite of the pilot's reputation, squadron personnel bilged the guy; they knew he had cut the same corners and made the same mistakes during earlier flights. Except no one had told the CO. After the mishap, the pilot's fellow aviators were officially criticized for failing to advise the reporting custodian that [the pilot] had a tendency to deviate from NATOPS. This failure was inexcusable, but that did not relieve the pilot of any responsibility for his actions.

Part of the official conclusion to this mishap sounds defeatist: "It has all been said before, it has all happened before, and there is no way to legislate against such mishaps in the future." I share the frustration. There were no extenuating circumstances, no sudden loss of hydraulics or power, no microbursts or fast-moving thunderstorms. I can't even speculate what this guy was thinking. This mishap may be nearly 20 years old, but things don't necessarily get better over the years. We are still finding the same mishap cause factors today. Pretty scary, huh?

COs, how well do you know your aircrews? Food for thought.

A final note. The MIR recommended "that this mishap and its history from flight planning to its final resting place be presented in narrative form in *Approach* magazine."

It may have taken 20 years, but that tasking is now complete. ◄

LCdr. Westerwick is an E-2 NFO, and has served with VAW-115. He is currently the E-2 analyst for the Naval Safety Center.

We Fragged Ourselves!

By Lt. John Musaus

The SDO's phone call woke me from a heavy sleep.

"Your brief has been moved up a half hour," he said. "They're making the first event an air-wing strike to Avgo Nisi."

"What event?" I thought. "I wasn't supposed to brief until later in the afternoon."

I looked down at the flight schedule, which had been slipped under the door, and there it was: first event, my pilot and me, 10 Mk-82 with Mk-344 fuzes, and two Rockeyes. I looked at my watch and saw I had less than 30 minutes until the air-wing brief. I will never forget the eerie feeling of the hair on the back of my neck sticking straight up. I was not prepared to take my inexperienced nugget pilot on this mission, which I estimated would take two to three hours to properly weaponeer. He had dropped live bombs only once in his life, and I had never used electrical fuzes.

My pilot and I pressed on to the air-wing brief. I knew he could tell that I was apprehensive about the flight, but I chose not to tell him about my reservations. The brief went longer than expected.Coupled with an additional section brief, and a brief with the spare crew, we were running late, which put us even further behind the power curve.

At this point, I made the fatal decision to press on with the flight. Looking back, there were many possible reasons for this, all of them falling under the category of poor judgment. I had this self-imposed feeling that this hop must go. I didn't want my air-wing bubbas to think that I couldn't hack this mission. I didn't want to let my seniors down by missing a sortie. I didn't want to let my pilot down. He was looking forward to his first live-bomb drop in the fleet.

In a rush, we borrowed a weaponeering gouge from someone who had dropped the same load the day before. This proved to be a huge mistake as "the gouge" doesn't come with the little notes of warnings and cautions that you would normally read in Tacmans while weaponeering.

We briefed a dive delivery, rolling in from 18,000 feet and pickling at 13,000 feet. We planned on making four runs to drop the 10 Mk-82s and one run to drop the two Rockeyes. We looked at how we were going to get to the target, and we rushed out of the ready room to man-up.

We arrived at the flight deck only to learn that we wouldn't have Rockeyes. I was glad that we weren't taking them, as I realized that we would be very short on time. Man-up and launch were uneventful, but on the rendezvous with the tanker, our INS dumped, further complicating things in our cockpit. Bad luck had it that the ship was about 100 miles away from the launch point used for timing, which delayed everyone's target times.

The wing had determined that the A-6 would be the last one on the target. I was getting perturbed that things were moving so slowly, and that we were being forced into making one run on the target to make our charlie time. We didn't want to be the goats to make it back to the ship late and delay the recovery and respot. We dialed up the quantity of bombs to drop to 10 (originally planned for three) and maneuvered for the roll-in. What we didn't realize, in the heat of the moment, was that by increasing the quantity of bombs, we increased our stick length—the interval between bombs—beyond safe limits. I remember making the decision in a rather nonchalant manner as if I were dropping practice Mk-76s at Dare County. If we had done our own weaponeering, we would have realized that this was a big no-no.

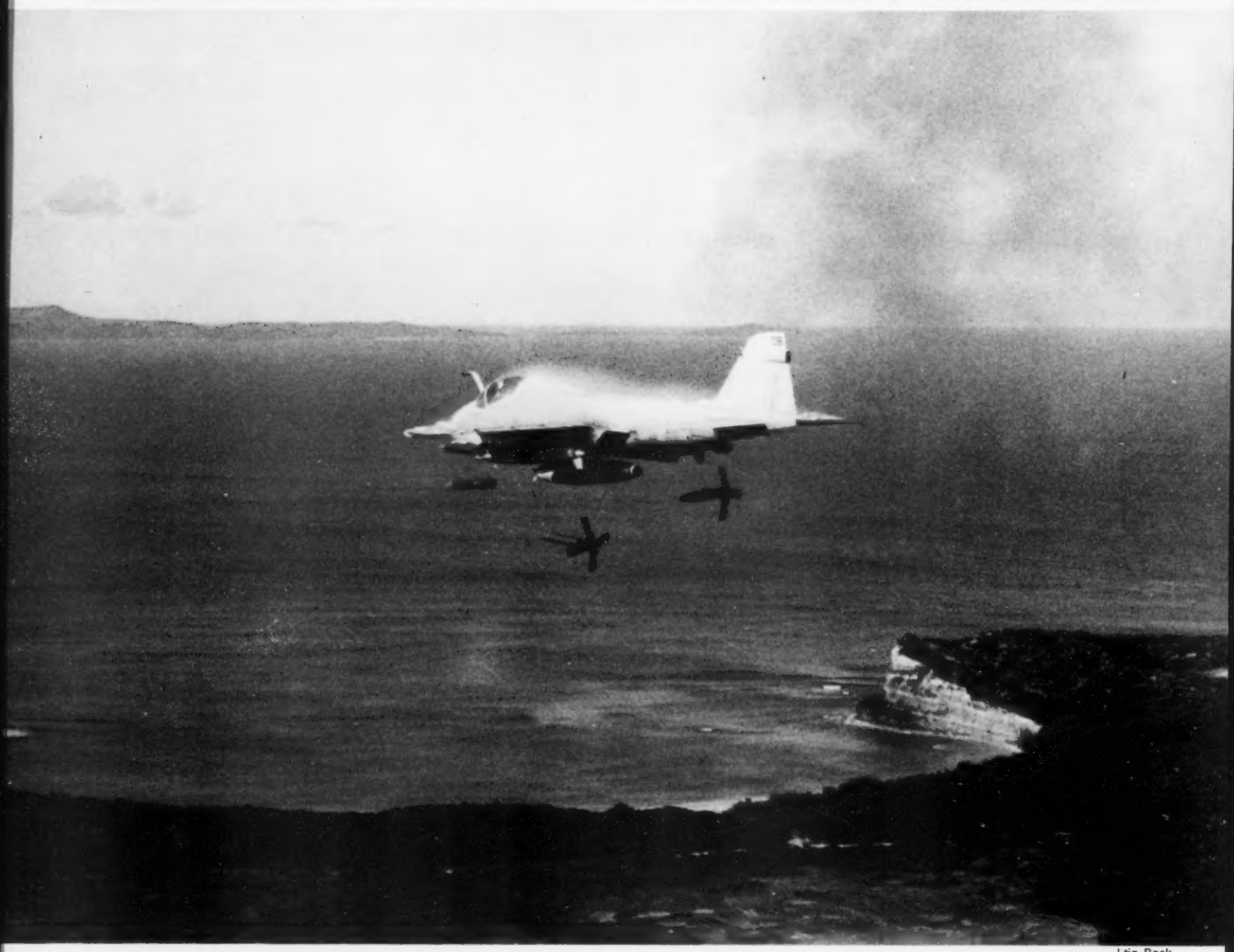
We rolled in on the target, and passing through around 13,000 feet, my pilot pickled. A moment later, I heard a loud, deep pop. I thought the canopy blew open, but when I looked over toward the left side, I could see that the rear-view mirrors were still attached. Then I saw the fire light illuminate as my pilot called out that we were on fire. In my rear-view mirrors, I could see that the rear of the plane and right wing were aflame.

As the aircraft began a rapid, uncommanded roll to the right, my pilot called for the ejection. I waited for the aircraft to roll right side up and then pulled the handle.

One of the Mk-82s had prematurely detonated under the aircraft; we had fragged ourselves. This point, coupled with the fact that we increased the stick length, really set us up.

There are so many lessons to be learned from this mishap. The biggest one for me is that I have to be the one to realize my own limitations. It is not the responsibility of others to do this for me.

I pulled the lower handle, and immediately, it felt like I had run right into Dick Butkus. Ejecting into a 480-knot wind blast is not fun. At one moment, it was



Ltjg. Bock

deafening; then suddenly, it was eerily quiet. At once, I found myself in my chute, looked up to inspect the canopy and was thankful it was full. The first thing I remember is taking a few deep breaths to regain my composure. I estimated that I was about 10,000 feet above the Med and that it would take a while to hit the water. I tried to turn around to look for my pilot's chute and the aircraft. I got a glimpse of his chute well below me before the wind turned my chute around from where he was.

As I looked down, I thought it was strange that my hands were hanging below my knees. The wind blast had blown both my shoulders out of joint and dislocated my left elbow. I managed to pop my left shoulder back into joint right away, but I still had no use of my left hand because of my elbow. It took me a few minutes to reset my right shoulder and, thankfully, it popped back into place. As soon as it did, the little man in my head started yelling, "IROK, IROK, IROK!"

I immediately inflated my lobes, released my raft, and started going through my options. As I began to try to take my mask off, I quickly found out that my mask, helmet, and eyeglasses had been ripped right off my head. I reached for my PRC-90 and realized that it was gone, along with both my front survival pockets. All that was left were the threads that once held the pockets.

As I floated down in my chute, I could hear another jet flying overhead and was relieved that someone knew exactly where we were. I couldn't tell what type of aircraft because I didn't have my glasses. I found it hurt my neck to try to move my head from side to side with the upper lobe inflated. The one thing that I didn't think about

was releasing my raft so high above the water. The winds were so strong that I thought for sure my raft was going to rip from its lanyard. The whole way down, the raft was blowing all over the place. I was very thankful it stayed with me.

As I neared the water, I prepared for entry by placing my right hand over my left koch fitting. My game plan was to release my left koch and then my right using my right hand. When I hit the water, I was probably doing around 20-25 knots across the ground, so as soon as I hit, I kicked my legs out and landed on top of my head.

The SEAWARS worked 4.0, and before I realized it, my chute was disconnected and had blown 50 feet away from me. I found the raft lanyard and began to pull the raft over to me. At this point, I knew I was in for a struggle. Trying to get into the raft with two good arms had always been a pain; now I was trying to do it with one. It took me roughly 30 minutes to get into the raft. Every time I thought I was close, a wave would come up and knock me over. I do not recall a time in my life when I swore so much as I did trying to get into that raft. I had wanted to disconnect my lower seat pan to get into the raft, but I figured I didn't have the grip strength to hold it and it would probably sink.

I was so tired once I finally got in my raft that it took me a while to get my seat pan off. I inventoried my gear and found that with my right hand, I could reach only one of my day-night flares. I got it out and prepared to fire.

A little later, I saw an aircraft approaching and decided to fire the flare. I tried to time it so that the aircraft would have plenty of time to see the smoke. I put the flare in my left hand and pulled the tab with my right one.

Since I had no real grip in my left hand, when I pulled the tab, the whole flare flew out of the raft. I thanked the PRs who were smart enough to tie a lanyard around the smoke to my vest. As soon as I reeled in the flare, I quickly stuck it between my knees and yanked the tab. Immediately, I got a face full of International Orange smoke.

By the time I got the flare pointed upright, the aircraft was long gone. There I was, holding this flare, looking like the Statue of Liberty, and thinking, "You are a moron." After expending my lone flare, the only signal device that I had was the bottom of my orange seat cushion.

About two hours after the ejection, an SH-3 from the carrier flew nearby, and I frantically waved my seat cushion. The helo flew right by me and didn't see me. I was discouraged, but then I saw that the helo was turning around toward me. I figured that this was going to be my best shot at being seen, so I lifted up the wet seat cushion, which by now felt like it weighed about 200 pounds.

When the H-3 flew by, I saw the crewman point in my direction and drop a smoke. Relief was the only feeling I had once I knew I had been spotted.

Photo is for illustration only.

The rescue swimmer jumped in and swam toward me. When he first saw me, his eyes were wide open, thinking that I was a bloody mess from all the orange paint on my face. He asked me if I was injured, got me out of the raft, and readied for the lift up. We remained on station for another hour, searching for my pilot until we were low on gas. Tragically, in spite of a three-day search, his body was never recovered. ◀

Lt. Musaus now flies with VA-42.

Supervisory Factors: The Myth

By Cdr. G.A. Barnett

How many times have we read in the CO's comments in an MIR, "I can't believe that my 'best' pilot could have violated SOP," or "had a midair," or "flown into a mountain." Nevertheless, the cause of more than 50 percent of mishaps continues to be pilot error. In these cases, AMBs regularly identify violations of NATOPS and squadron SOP as causal factors. Should anyone else be held responsible for pilot-error mishaps?

In those same MIRs, supervisory factors are often identified as causal factors. They are often difficult to justify, and supervisory error consequently ends up either being omitted or rejected by endorsers because of lack of hard evidence. Yet, after rejecting supervisory error as a causal factor in a recent MIR, the CO of the mishap pilot actually supported supervisory error as a valid causal factor for mishaps in general, saying that it is the CO's responsibility to "monitor aircrew closely" and identify aviators who exhibit destructive behavior.

How does a mishap board define "failure to establish a command climate that promotes open communication"? Safety is the responsibility of everyone in the command, and everyone should report violations of safety procedures. But, who is responsible for ensuring that junior officers and petty officers do so? Total Quality Leadership advocate W.E. Deming provides us with a statement about quality that, with some adjustment, applies to safety.

"The cause of the decline in American [squadron] product quality [safety] is that management has walked off the job of management."

When COs fail to demand that supervisors be responsible for safety awareness, then they have "walked off the job." To eliminate pilot error as a causal factor in naval- aviation

Should anyone else be held responsible for pilot-error mishaps?

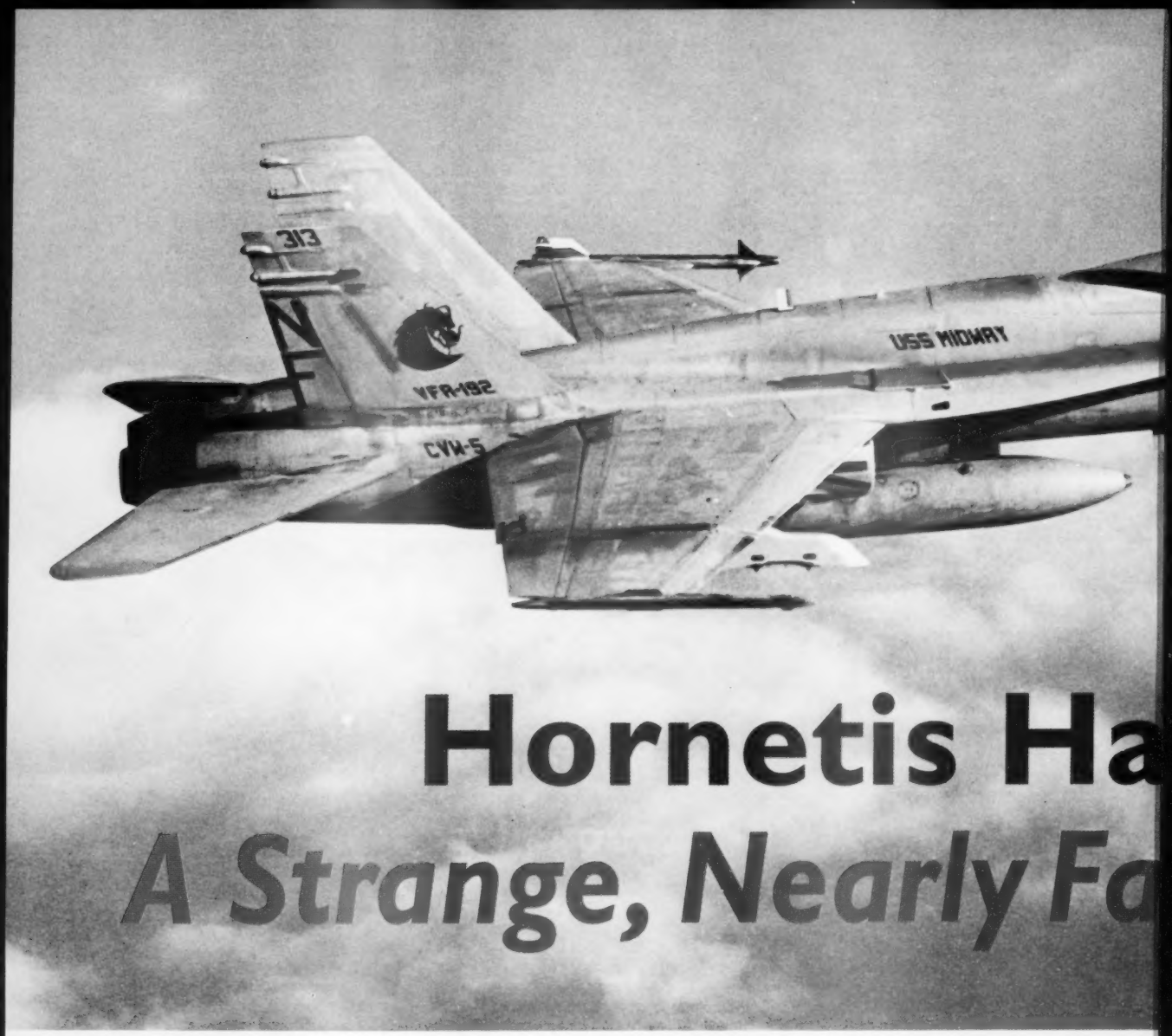
mishaps, we must first identify aircrews who demonstrate a higher-than-average probability of being involved in a mishap, and then take the appropriate action *before* they have a mishap. Perhaps increased use of human-factors councils is one way to promote more open communication up and down the chain of command.

Although it is a relatively recent development to call supervisory error a causal factor, supervisors have always been responsible for aircrews complying with all safety guidelines. However, only in cases of clear negligence have they been held accountable for pilot-error mishaps. Why didn't they know when their best pilot was setting up for failure? If everyone else knew about the mishap pilot's tendencies, there is no excuse for the commanding officer or OINC not knowing. Perhaps the JO mafia established a conspiracy to protect the mishap pilot, or the CO chose to ignore the situation. In either case, supervisors must be held accountable for *not knowing*. A trusted junior department head, one who can still be part of the JOs' group, but who is not afraid to talk to the XO or CO, could help get around the JO mafia. COs and XOs also need more training in human factors.

Identifying supervisory error should be seen as a means of eliminating future mishaps and not as a personal affront to squadron COs or OINCs. COs must take measures to ensure that they are aware of all the human factors that could contribute to a mishap. These measures include developing a rapport with the JOs, and using human factors councils to obtain and evaluate information about aircrew performance.

Only then, if pilot error is identified as a mishap's causal factor, can a squadron skipper say with confidence, "I can't believe that my best pilot was a flat-hatter." ◄

Cdr. Barnett is a RIO with tours in VF-21 and VF-124. He is currently assigned to COMCARGRU-3.



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A Strange, Nearly Fa

It was one of those days when all was right with the world. I was the new CAG LSO on the Navy's newest ship, flying the newest airplanes in the inventory. After my tour in the FRS, I was excited to be back in the fleet and doing some tactical flying.

The previous day, the operations officer had asked me if I would like to lead a mini-strike consisting of two Tomcats, two Intruders and four Hornets. I jumped at the chance and was full of anticipation for a great hop. The day began as one of those days in SOCAL when you can see forever.

At this point, I'll digress a little. I had just come from a tour in the FRS where I was an instructor in the air-to-air phase. As in all phases of training, we stressed habit patterns very heavily. Solid habit patterns make solid aviators. You have to do the same thing at the same time on every hop, and if something interrupts your habit pattern, you become acutely aware of the potential to forget something.

One area we stressed during the air-to-air phase was trigger squeezes. The Hornet's video recording system allows the review of HUD tapes and shows a cue when the pilot squeezes the trigger. It does no good to arrive at a valid weapons envelope and not get a missile off because you are not in the habit of squeezing the trigger. We reviewed these HUD tapes after every mission to ensure the pilot actually squeezed the trigger as he called the shots.

My wingman and I came up with a solid plan. We

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By LCdr. Mike Cross

LCdr. T. B. Surbridge

would be opposed by some "bad guys" from a nearby air station. As our brief time approached, however, things began to change. Strike ops called and reduced our package to just two Tomcats and two Hornets. Not a big deal since we still had plenty of firepower.

Then, just as we started our brief, the SDO told us that we would each be carrying a live AIM-9 missile besides our practice "blue death." I quickly checked to make sure we could go configured like that. After receiving approval, we proceeded with the brief.

The brief, man-up and launch all went smoothly, and we were soon on our way. As we approached the start of our tactical route, we tried unsuccessfully to check in with the bandits. I assumed they must have had some aircraft delays and decided to press on.

At the appointed time, our Tomcats pressed out in front of us and swept through the target area to clear out any bandits. My wingman and I arrived unopposed, completed our tactical deliveries, then climbed up to do some dry runs and weapons-system grooming.

As I came off target from my second run, I reached up to turn master-arm off and called, "Off target." At that instant, I looked across the circle at my wingman to find an F-16 rolling in on him. I called for my wingman to break and my fangs came out as I put the airplane in the air-to-air mode and lit out for the bandit. I called several quick shots against the bandit, who didn't see me until it was too late. After seeing me, he did an aileron roll and left. I turned back toward the target and found myself in perfect position to roll in again.

"Gee, just like the commercial," I thought as I called in and reached up to turn the master-arm back on. My heart stopped as I stared in horror. The switch was already in the on position!

I screamed to myself, "You idiot, you've got live missiles!" I was almost afraid to look out and see if I still had my missile on the airplane. To my great relief, it was. I managed to stop shaking enough to get us back to the ship and land.

In our debrief, I told my wingman what had happened, and he was as shocked as I had been. To this day, I am not sure exactly why I did not squeeze the trigger. After all, my ingrained habit pattern was to squeeze the trigger at shot simulations. I can honestly say I didn't remind myself about that live missile as I engaged the bandit. The only thing I can think of that kept me from continuing my normal habit and actually squeezing the trigger was the attention we had paid to carrying live missiles previously. As I calmed down and thought more about this event, I realized that I had done a couple of things right and a few things wrong.

First and foremost, we had briefed the live missiles in detail, going over the squadron SOP closely as to when the trigger could and could not be squeezed. Second, we had reviewed a mishap a few days before where a Hornet pilot had unintentionally fired a missile. We talked extensively about carrying live missiles on training flights.

The things I had done wrong were nearly fatal for that F-16 driver. First, I should not have engaged him in the target area. Per our brief, I should have told my wingman to rock his wings to acknowledge the bandit's presence and continue our bombing. Second, I had allowed my aggression to interrupt my habit pattern of safing up off-target. ◀

LCdr. Cross flies with VFA-22.

My Stick Is Stuck!

McDonnell Douglas Corp.

By LCdr. Charles L. Boone

The F/A-18B approached the numbers at NAS Lemoore and made a crisp carrier break. After the normal landing checks, the crew prepared to end what had been a short flight because of some minor malfunctions.

"Flash 23, wind 340 at 7. Cleared to land runway 32 left."

"Flash 23, roger, cleared to land on the left."

The Hornet crew double-checked the landing gear. After touchdown and initial rollout, they discussed the flight. The pilot brought the control stick back, raising the horizontal stabilizers to slow the aircraft for normal braking.

"Base, 200 is on deck."

"Roger, 200, bring it straight to the line."

"Well, that was a short flight," the backseater remarked.

"Yep," the pilot agreed, "it sure was, but it's flight time."

As the pilot moved the stick back to neutral, the backseater and his pilot didn't know that they were about to take a ride.

"Brakes are good," the pilot reported.

Boom! Boom! Whoosh!

"I've been ejected!" the backseater thought. "I'm tumbling. I can hardly see!" His glasses had been ripped away by the force of the ejection.

"The ground is coming up fast. Did I get a chute?"

People on the ground watched the two crewmen descend in their chutes.

The crash phone rang. "This is the tower with an emergency. We have two chutes midfield, runway 32 left! Aircraft has rolled off the runway adjacent to gear four, runway 32 left. All stations acknowledge."

Meanwhile, the backseater began to take stock.

"OK, I'm out of the seat. Opening shock. Wow! I felt that! Ground's coming up fast. There's a swing, but did the chute open all the way? Was there time? Got to somehow get into the right position. Got to roll like they taught us..." Crash!

Dazed and confused, he felt pain in his right foot, knee and head, which had smacked the ground. The backseater tried to assess the situation and the extent of his injuries. Afraid to move because of tingling in his legs and back, he lay still as his pilot, who was not hurt in the ejection, rushed to his aid.

"What happened? Are you OK? Are you hurt?"

The backseater replied, " I don't know. My right leg hurts, and my feet and legs tingle."

"OK, don't move. It's gonna be alright. Just don't move."

Still dazed, the backseater drifted in and out of consciousness. His pilot, adrenalin pumping, did his best to reassure his injured comrade as he disconnected the backseater's parachute. Emergency vehicles converged on the scene, and the pilot ran to greet them waving his arms.

"Crash vehicle approaching 32 left," Tower called, "you're cleared 32 left. They're directly ahead of you on the runway."

"Roger, Tower, I have the aircraft in sight. It's rolled off the side of the runway. The engines are still running! Looks like both crewmen are down, but one isn't moving. One is running back to the other. We need an ambulance immediately!"

Field crash crew, assisted by squadron personnel on the adjacent ramp, secured the aircraft's engines as ambulances arrived to pick up the mishap aircrew. The pilot and NFO arrived at the hospital and received medical attention.

Meanwhile, the mishap-investigation team started looking at the event. The pilot remembered feeling resistance when he tried to ease the stick forward to neutral after the aerodynamic braking. What this crew didn't know (nor did anyone at the time of this mishap) was that just the right combination of items, in the right place in the cockpit, set this chain of events into motion. The investigation found that a combination of flying with either seat all the way up, having the ejection handle rotated slightly forward, and pulling the stick back (as in aerodynamic braking) could catch the ejection handle.

The backseater normally flew with his seat all the way up, and the ejection handle rotated forward for easy access. As a result, his seat (and the pilot's because of command ejection) fired when his ejection handle caught on the upper part of the stick when the pilot brought his stick back. Although this mishap involved an F/A-18B, the same hazard exists in a single-seater. The Hornet has flown with this arrangement since it's conception; yet, somehow, all the right pieces had fallen into place only one other time.

We learned several important lessons from this mishap. First, it's not a good idea to fly with your seat all the way up with the present design! Of the three parts of the equation necessary to cause this mishap, seat height is the easiest and most practical to control. Ejection could have happened in the air as well as on the ground. Some shorter pilots in the community fly with their seats nearly all the way up.

Some numerical data on this mishap make it even more interesting. At ejection initiation, the pilot experiences a 200-250-G/sec onset rate, with an average of 12-15 Gs until rocket burnout.

The seats in the mishap aircraft had 17-foot aeroconical canopy parachutes. During the ejection sequence, the backseater might have had one good swing before hitting the ground, with an estimated rate of descent of 25 fps (or just over the equivalent of jumping off a one-story building). Statistics show that 80 percent of aviators who eject from F/A-18s over land, have been injured because of their rate of descent. Newer Hornets have 20-foot aeroconical parachutes in their NACES seat.

LCdr. Boone was assigned to VAQ-34. He is currently with the Strike-Fighter Weapons School, Pacific.

A hazard report by the AMB before the MIR was released was instrumental in making this hazard a short-notice agenda item for an F/A-18 NATOPS conference. The hazard report also got the ball rolling on testing and evaluating alternatives. Don't wait for a NATOPS change. Read and heed the message traffic!—LCdr. L.O. Prince, F/A-18 analyst, Naval Safety Center. ◀

PH3 R.L. Washington

BRAVO ZULU

Left to right: Capt. Robert Lanham, Capt. Justin Orabona, 1stLt. Charles Ehlert, 1stLt. Anthony Slick

Capt. Robert Lanham, USMC
Capt. Justin Orabona, USMC
1stLt. Charles Ehlert, USMC
1stLt. Anthony Slick, USMC
VMFA (AW)-533

Fifteen minutes into a low-level training mission, 1stLt. Ehlert (pilot) and 1stLt. Slick (WSO) lost all radio and intercockpit communications in the F/A-18D. Further investigation revealed that they had lost the indicator for their integrated fuel-engine system, all indications for engine-oil pressure, nosewheel steering, and fuel-dumping capability. They also had several cautions for flight control, unsafe gear in the rear cockpit, and a ready light for fire extinguishing.

First Lt. Ehlert immediately zoom-climbed to 17,000 feet, squawked emergency, and signaled for the lead aircraft to join.

As the flight turned toward Aviano Air Base (in Italy), Capt. Lanham and Capt. Orabona called Italian ATC and declared an emergency. They also called their base ODO to tell him that they would need the short-field arrestment gear.

Aviano Approach Control reported that the duty runway was 05, and that rigging the gear would require at least 10 minutes. Unsure of how long his wingman's aircraft would remain flyable, Capt. Lanham (flight lead) signaled for a lead change and started a teardrop entry to runway 23. Meanwhile, Capt. Orabona (lead WSO) held up the high-altitude approach plate to runway 23, and communicated with hand signals that the cables for the duty runway were down.

After lowering the landing gear, 1stLt. Ehlert saw that he had no HUD symbology or indications for three down-and-locked. He signaled the problem to the other crew, who confirmed that the gear was down.

At this time, 1stLt. Ehlert shouted to 1stLt. Slick that he intended to touch down approximately 500 feet short of the approach-end gear. He hoped to reduce his cable-engagement speed below max trap.

Heavy, with full flaps and gain override selected, 1stLt. Ehlert flew an approach to an arrested landing.

Postflight investigation revealed that the utility power contactor had failed in the closed position, causing the utility battery and the essential DC bus to fail. ◄

Left to right: Mr. Vernon Pugh, Lt. Christopher Ferguson

Lt. Christopher Ferguson
Mr. Vernon Pugh
Naval Air Warfare Center,
Aircraft Division
NAS Patuxent River

While chasing an F/A-18C on a weapon-separation test at 1.08 IMN and 2,500 feet AGL, Lt. Ferguson (pilot) and Mr. Pugh (mission specialist-photographer) heard a loud bang, and felt a severe low-frequency vibration. Simultaneously, Lt. Ferguson saw the stall light for the right engine illuminate.

Quickly retarding both throttles to idle, Lt. Ferguson climbed. He monitored his F-14's engine instruments for compressor stall indications. TIT increased only slightly and then subsided as the stall light went out.

Mr. Pugh noticed that the leading edge of the right engine's intake was missing.

The pilot secured the right engine, and the photographer read appropriate NATOPS procedures for single-engine cruise and landing. The crew recovered uneventfully.

An inspection showed that the first 12-16 inches of the leading edge of starboard intake was gone. The right engine was FODed with large metal pieces lying against the face of the first-stage compressor. There was also damage to the lower leading edge of the intake and leading edge of the horizontal stabilator.

The incident is under investigation. ◄

Left to right: Lt. Kurt Miller, LCdr. Kevin Schaaff

LCdr. Kevin Schaaff
Lt. Kurt Miller
VS-30

Dymon 701, an S-3B, was returning to USS *Saratoga* for a day recovery. The approach started normally, and Lt. Miller (pilot) rolled into the groove with a centered ball. As the Viking was in the middle, the master caution light appeared. LCdr. Schaaff (COTAC) immediately told Lt. Miller, "We've just lost No.2 hydraulics." After scanning the engine tapes and gauges, the COTAC called, "We've lost No.2 engine!" as the engine flamed out.

At maximum trap weight, the S-3 was flying on one engine, descending, with the flaps fully extended. Options were limited.

For a single-engine landing, NATOPS calls for takeoff flaps and zero rudder trim. However, at 120 knots, on speed, raising the flaps would probably make the aircraft settle into a ramp strike. If the pilot tried to wave off, he risked an in-flight engagement.

With a centered ball, LCdr. Schaaff recommended, "Continue." Lt. Miller agreed, and he applied power and rudder, flying the crippled Viking to a safe arrestment.

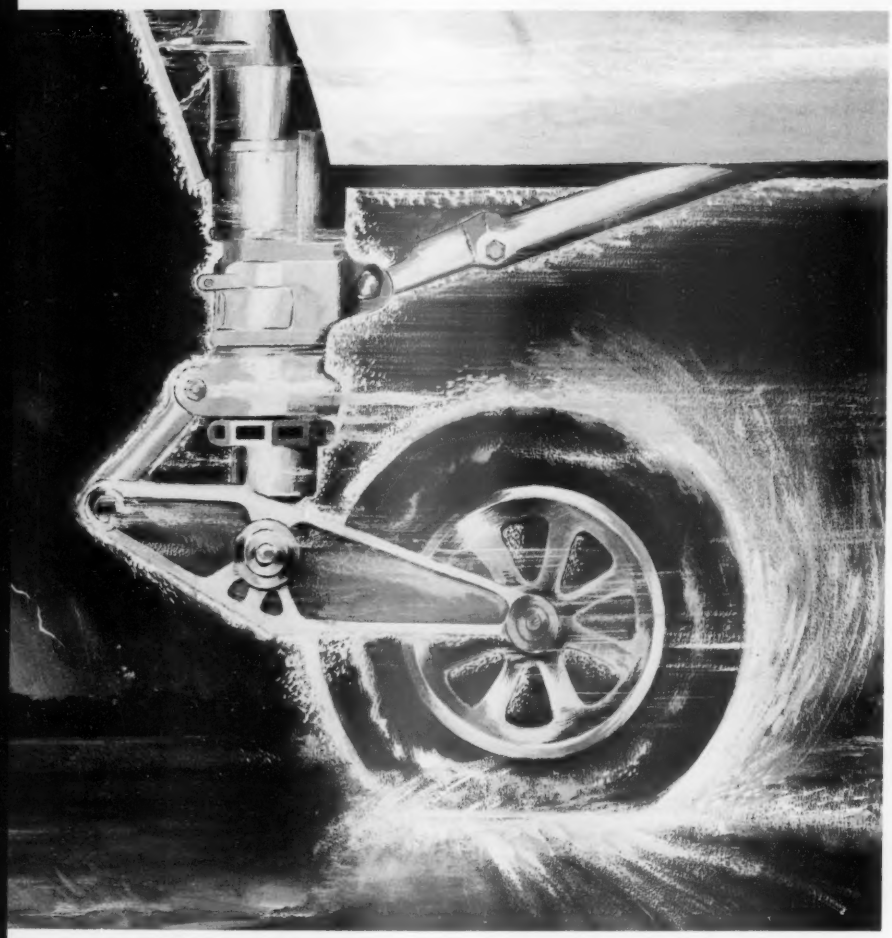
Postflight troubleshooting determined that a fuel-control failure caused the flameout.

The loss of an engine in a situation such as this is a worst-case scenario, requiring crew coordination, split-second decisions, and precise airmanship. These two aviators made all the right calls. ◄

BZs require an endorsement from the nominating squadron's CO *and* the appropriate CAG, wing commander, or MAG commander. In the case of helo dets, the CO of the ship will suffice. A 5-by-7-inch photo of the crew by a squadron aircraft should also accompany the BZ nomination. Please include a squadron telephone number so that we can call with questions.

Hydroplaning Primer

By Cdr. Jim Coulson



The mainmounts touch down, the spoilers come up, brakes check good...Everything OK, right? Not necessarily. There is a transition period during landing rollout when the aircraft is no longer flying, but it is not at safe taxi speed, either. Numerous forces continue to act upon your aircraft. Until you are in the chocks, you aren't "safe on deck."

Your knowledge of those forces may determine whether you return your jet home in one piece, or in multiple pieces (the latter being decidedly unpopular with your chain of command and squadronmates).

As your aircraft transitions from flight, the lift from your wings is gradually replaced by main- and nosewheel-force vectors opposing the weight vector of the aircraft. Aerodynamic drag and braking friction gradually overcome inertia.

At speeds less than 60-70 percent of landing speed, aircraft braking is the main force slowing the aircraft, since aerodynamic drag and lift are no longer critical factors. (For an average 123-knot approach, this translates to approximately 87 knots).

Brakes depend upon the coefficient of friction (cf) for their stopping power. As you can see from Figure 1, when water enters the equation, braking forces are drastically reduced. On a hard, dry runway, the coefficient of friction is approximately 0.75. This figure decreases rapidly on wet runways, increasing landing distances by 40-100 percent. Hydroplaning can increase these distances even more.

There are three types of hydroplaning: reverted rubber, viscous (thin-film lubrication), and dynamic. With all three types, water in varying amounts is the culprit.

Reverted-rubber hydroplaning only occurs when your wheels are locked. The friction between the tire and the runway turns the water trapped by the aircraft tire's footprint into steam. The steam melts the rubber and the tire slides on the soft, tacky rubber, trapping more steam.

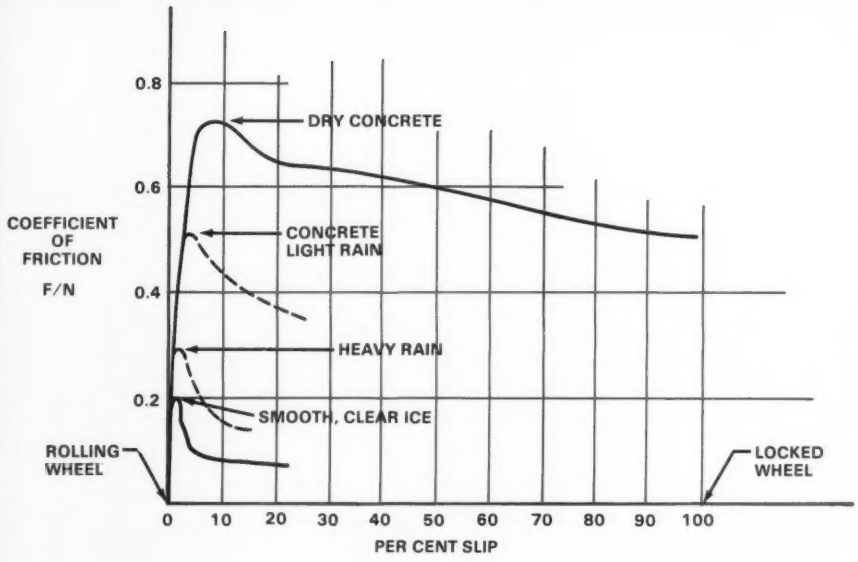


Figure 1

The tire then begins riding on a cushion of steam. Evidence of this phenomenon exists as white marks on the runway—in effect, a steam-cleaned patch! Any pilot who has ever "bullseyed" a tire has seen the precursor to this type of hydroplaning. All that was missing was the water.

A contributor to reverted-rubber hydroplaning is the rubber deposits (the black patches on approach ends of runways) that fill the pores of runway concrete and allow a near-frictionless surface to develop. This appears to promote an earlier onset of reverted-rubber hydroplaning (at speeds from 120-20 knots). Add a little H_20, and you have your own skating rink.

In viscous hydroplaning (thin-film lubrication), the fluid acts as a lubricant to reduce rolling friction. Having a smooth concrete surface, a contaminated surface (i.e., a runway coated with oil or jet fuel), or a locked-wheel skid, coupled with the presence of water, can promote viscous hydroplaning. The coefficient of friction on a smooth concrete surface can be as low as 0.05. Remember that dry, textured concrete cf is 0.75!

Even a small amount of water can cause hydroplaning when conditions are right.

The third type of hydroplaning is dynamic hydroplaning, where the tire actually rides upon the fluid. This type generally occurs with standing water on the runway (generally 0.4 inches or more). This is the least common type of hydroplaning because of the high speeds required. The speed at which dynamic hydroplaning will occur can be predicted. Dynamic hydroplaning speed is 9 times the square root of the tire pressure.

What does all of this mean to an aircrew? At lower speeds, you will lose turning forces and braking to some extent; you may skid or fishtail. Slightly higher speeds bring even greater problems, such as complete loss of directional control, where you cannot stop or even steer your jet.

Although a higher-pressure tire results in higher dynamic-hydroplaning speeds, the smaller "contact patch," or footprint, makes the wheel more susceptible to the other two types of hydroplaning. Remember, one, two, or all three conditions and types can occur at one time.

How can we combat all types of hydroplaning? First, by education. Average landing distance for an EA-6B is typical for most jets—3,000-3,500 feet. Since water can almost double your stopping distance, an 8,000-foot runway can quickly become too short. Know before you go! When in doubt, take a precautionary trap.

Second, use anti-skid braking. Get the brake forces on the wheel with friction where it counts. Raising the flaps when firmly planted on the runway may also help. When you're not sure about the condition of the runway, with a known anti-skid braking problem, take a trap. Spending a little time getting out of the arresting gear may save a lot of time filling out mishap paperwork.

Lastly, consider runway design. Grooves may promote FOD collection, but there is no substitute for them to prevent hydroplaning. Grooves vent the water away from the tire, reducing the film for viscous hydroplaning and increasing the depth necessary for dynamic hydroplaning. Also, the grooved edges skim reverted rubber from the tire.

Asphalt is better than concrete. The rougher the surface, the better. If your air station can keep the approach and departure ends clean of rubber deposits, it will also make a difference.

Sources:

•*Aerodynamics for Naval Aviators (NAVWEPS 00-80T80)*

•*Fixed-Wing Aerodynamics,* (Navy PG School Aviation Safety Programs)

Cdr. Coulson is an NFO and the CO of VAQ-130.

THE LAST LINK

By Lt. Mike Curtis

The memorable "There I was..." situations usually occur when we get down near the end of the chain; the tragic ones occur when the last link goes unbroken. Not long ago, I got too close to that link.

I was the copilot for our det OIC, with a seasoned AW2 in the back. We launched in our SH-60B just before sunset on a surface-surveillance mission. We flew through "pinky time" and into a clear, black night.

As the time for flight quarters drew near, the ship pulled an all-too-familiar stunt.

"Venom, we're going to push back flight quarters 15 minutes so you can ID a couple of contacts to the north."

Our crew groaned collectively (the only way to groan in a helo) and headed north. The night's blackness forced us to descend to 200 feet to positively ID the contacts as fishing boats. The HAC reported, "Leaving 400 for 200" and "Level at 200" as I backed him up on the gauges.

With the contacts identified, the ship now called flight quarters.

"OK, landing checklist," called the HAC as he nosed the aircraft over to quicken our return. We were about 15 miles north of the ship.

"Roger," I responded. "Contingency power is on, tailwheel and brakes are set, radar..." That's when a rapidly moving needle on the instrument panel caught my eye. As I looked up, the needle was now accompanied by a flashing red light and a beeping tone.

"Boy, the ol' radalt sure is working overtime tonight!" I thought. "But hey, wait a minute! Radalt? Isn't that the instrument that tells you...?"

"Altitude, altitude!" I shouted. It was the only word my brain would allow. Meanwhile, the HAC pulled power, and I grabbed the cyclic and pulled back. By 60 feet, we were climbing.

What had happened? What was the problem? Too much trust. I trusted the HAC too much, and he and I both trusted the radalt-hold too much. Once he'd called for the landing checklist and nosed over, both our scans had broken down; he was fixated on the groundspeed, and I was reading the checklist. According to our standard brief, my first altitude call should have come at 150 feet, not 80 feet. And what about the AW? He was in the back derigging the night-vision device for landing. While there is nothing wrong with that, it brings up a good point; an AW is one more set of eyes in the aircraft. He doesn't always have to monitor flight parameters, but during a black night at 200 feet, it's not a bad idea.

AW1(AN) Steven B. Connolly

We debriefed the episode that night, and the next day, we experimented with the radalt hold. It held fine in turns, but when we nosed over for acceleration, the aircraft went from 400 to 200 feet before pulling us back up to 400. Hmmm, 200 feet of play, and we'd been at 200 feet.

So, let's look at the links that almost led to the disaster. An untimely call for the landing checklist, two failed scans (which led to a failed standard brief item), and too much trust—in people and in equipment. And which link broke the chain? The one with a flashing light and a beeping noise.

Had we indeed reached the "final link"? It's hard to say. There would still have been three or four seconds to impact had I not said anything. One of the other crew members might have caught it. Heck, the radalt hold might have pulled us up just in time. At any rate, I hope I never get that close to the end of the chain again! ◀

Lt. Curtis is a pilot with HSL-48's Det 2.

We Can Do *Without* This Type of Visibility

By Lt. Brian P. Grant

I had been in my first fleet squadron for a few months and had so far survived without embarrassing myself or the squadron, but this was about to change. We were on our air-wing detachment to Fallon. Workups were going well, I was feeling confident learning the Hornet's missions, and I could do anything with the jet—or so I thought.

The pace of the det was fast and furious, with a typical schedule of eight-turn-eight*. We needed every jet to make the flight schedule. One day, a pilot aborted his takeoff because it didn't appear normal. The high temperature, high altitude and heavy bomb load had caused the brakes to melt and the tires to catch fire. The pilot debriefed maintenance control that "his brakes didn't feel right on the abort."

Maintenance replaced the tires and checked out the brakes and anti-skid system. They couldn't sign the gripe off until they made a taxi check, and they needed a pilot to do that.

It was 1800 and the ready room was empty since everyone was either briefing for their night hops or having dinner. Here's where I entered the picture as the SDO. Maintenance told me we'd lose a sortie tomorrow if the brake check wasn't done before dark, so I called the club and passed the word that we needed a brake-check pilot. It seemed that everyone was either in the middle of dinner or had been rolling dice with Ruthie, so I didn't get any takers.

I got word that the skipper had said not to worry about it. What the skipper really had said was, "Don't do it tonight; we'll brief a pilot on how to do it tomorrow." What I *thought* he said was that there was no one at the club who could do the brake check. Mistake number one.

I passed to maintenance control what I thought the skipper had said. They repeated their last comment about losing a sortie tomorrow. The "light bulb" came on and I volunteered to do the brake check myself. I told the maintenance chief, "Hey, no sweat, I can make this happen." I'd never done a taxi test before, but how hard could it be? Mistake number two.

I went down to maintenance control and signed for the jet. The chief said there might be a malfunction with the anti-skid system, so I should take it above 35 knots to see if that was the problem.

"Be glad to," I said. I wasn't happy to see that the jet had almost a full bag of gas, but it would take too long to defuel, so I accepted it. Mistake number three.

I preflighted the jet, taking note of the brand new main mounts. I jumped in and got clearance to do the check on the outboard runway. I planned to accelerate to 50 knots, testing the brakes a couple of times on the way down the runway and a few times on the way back. The brakes felt OK on the first attempt, but the next time they started to fade. By the third and fourth checks, I knew that there was a brake problem. Mistake number four. Hey buddy, get a clue. The jet was heavy, and I'd repeatedly tried to stop it from 50 knots. The brakes were getting hot, so of course they didn't feel right.

I started to taxi clear of the runway when the brakes began to grab. Just as I got to the taxiway, the tower called "301, you're on fire!" I stopped, shut down and hopped out. There was smoke and the smell of burnt rubber in the air. Both brand new tires were now flat, but, luckily, there was no fire. After the crash crew cooled off the hot brakes, the maintenance crew arrived to change the tires for the second time that day. It was a very long ride back to the hangar in the duty truck. I walked into maintenance control just as the skipper was manning for his night hop. He didn't have much to say, except that the brakes must have worked well for them to get as hot as they did.

The moral of the story is that no matter how simple a task seems, if you don't know what you are doing, don't do it. Get some instruction first. My "initiative" cost the squadron two new tires and a slew of man-hours to change them, not to mention the visibility it brought our squadron in front of the rest of the air wing.

The jet was heavy, and I'd repeatedly tried to stop it from 50 knots. The brakes were getting hot, so of course they didn't feel right.

Lt. Grant flies with VFA-146.

**Not for the faint-hearted, an eight-turn-eight schedule indicates eight aircraft launch, return for a turn-around, and launch on another sortie.–Ed.* ◄

FAMOUS LAST WORDS:

"It Never Rains in California"

"I Thought You Had the Tickets"

"The Gear Should Be Fine"

By Lt. Chris Rollins

I had been a T-2 SerGrad instructor for nearly a year. I had accumulated about 500 instructional hours in that time, and had received my instrument IUT qual. I was glad to get this qual because even though I enjoyed instructing students, it was a pleasant break to fly naval aviators. I also honestly felt that I deserved the qual. After all, I now had more than 700 hours. I didn't know everything about flying, but I did feel experienced and knowledgeable.

Since much of the squadron had departed on a December CQ det to NAS Key West, the flight schedule in Meridian was light. One afternoon, a call came from the det in Key West. One of the Buckeyes had pulled up lame, and they needed another airplane ASAP for tomorrow's CQ schedule.

Always looking to get an "X" out, Ops scoured the grease board for a student. That idea was not feasible; it would take too long to get a student called in, briefed and in the air. There was, however, a new SerGrad going through the IUT syllabus, in need of some instrument hops. Seeing this situation develop, I saw the opportunity to escape Meridian by grabbing this hop and spending a few days in warm, sunny Key West. I quickly pointed out to the Ops officer that I now had my IUT qual. He said OK, but I needed to leave quickly. I was so anxious to ensure that no one else horned in on my good deal that I didn't even take the time to go home and pack. I went to the exchange to buy a few necessities.

My IUT student and I assembled for a hurry-up brief in no time. In fact, we briefed while we filed and got weather. He would take the front seat and I would be in the back. The plan was to take off, climb to FL370, and cruise at max range. We hoped to have enough gas left to shoot a TACAN to a missed approach, and then a PAR to a full stop. Somewhat ambitious, considering the distance involved, but I felt like we could do it. After all, if we didn't have the gas, we would simply land.

"We won't push it," I said.

We got off the ground expeditiously and climbed to FL370 with few delays. The IUT was doing an excellent job flying the plane. We traded stick time while covering the training objectives. Passing abeam MacDill AFB, we had about 2,300 pounds of gas. Not bad, but 2,000 pounds was the generally accepted min fuel at that point. We were in good shape to make Key West, but getting two approaches looked a little iffy.

"Not a big deal," I said. After all, we weren't going to push it.

We arrived at the initial for the HI-TACAN with about 1,200 pounds of gas and good weather, although it was now night time. I had already decided we would have enough gas to shoot the missed approach and the PAR, thus completing two "Xs."

About three miles from the final approach, we went dirty. The left main and nose gear went down and locked normally, but the right main indicated unsafe.

"I've seen that before," said the voice of experience from the back seat. "After a long, high altitude flight, it sometimes takes a little extra time for the gear to go all the way down and lock the first time they're lowered. It's probably down and just needs to go over center to lock."

The IUT replied that he could see it wasn't down, but instead hung at a 45-degree angle. After about 15-20 seconds of staring at the barber pole, I told him to continue the approach while I broke out the PCL. A quick look at the gas gauge showed that we had over 800 pounds. Not a huge amount of gas, but enough to troubleshoot the problem and, if we had to make an emergency landing, enough gas to get set up for it.

"Just continue," I said. "It'll come down."

At about that time, the right main finally dropped down, and we now had three down-and-locked. The student immediately pointed this fact out to me and indicated his feeling that we should full stop on this pass since the gear had malfunctioned. I took another quick look at the gas gauge. If we used 300 pounds for the lap around the GCA pattern, we'd still have about 500 pounds, 50 pounds above min fuel on deck. As for the gear, well, they did come down after a delay, just as I had predicted. They would be fine.

"No," I replied, "we've got enough gas. The gear should be fine. Let's go missed approach and do the PAR."

As we went through the missed approach and the gear came up, I wondered to myself if I had made the right decision.

"Oh well," I thought, "the gear will come down just fine, we'll do the PAR as briefed, and then I'll know I made the right decision."

At about six miles, we turned final and again lowered the gear handle. My worst fears came true; the right main went unsafe and hung at a 45-degree angle.

"Just continue," I said. "It'll come down." But it didn't.

After the 15 to 20 seconds it had taken to come down the first time, it was still unsafe and still hung up. We continued inbound as I again reached for the PCL. We were now approaching glidepath and still could not report, "Three down-and-locked." Finally, I told the controller that we were having gear trouble, and that we would tell them when we were ready to turn inbound.

I requested a vector outbound while we did some troubleshooting and while I looked up the procedures in the PCL. A quick look at the gas gauge showed we were almost at 500 pounds. Gone was the cushion of fuel that I had only a few minutes before. Now we would have to do some quick troubleshooting, while low, over the water, at night. If we couldn't fix the problem, we'd have to make some quick decisions.

Peter Mersky

The procedures called for applying positive Gs, removing hydraulic power to the gear, and trying to yaw the gear down. Applying positive and negative Gs, and cross-controlling the rudder and ailerons in order to yaw the gear down, at 1,200 feet, over water, at night, was not an appealing scenario. We did not, however, have the fuel to climb to a safer altitude to attempt this. The plan was set. Once out of the turn, we would begin the procedures.

Just as we approached rollout on the vector, we heard a clunk and the right main, thankfully, went down and locked on its own. I felt a tremendous weight lift from my shoulders.

We reported, "Three down-and-locked, ready to turn inbound," to Approach and got an immediate vector inbound. The final result of this flailing was that we made a 360-degree turn and shot an uneventful approach to full stop. We rolled out within an eyelash above minimum fuel on deck.

After we filled out all the paperwork, I remarked to the IUT that my decision to do the missed approach was probably not a good one. Although he didn't say it, his expression indicated that I was stating the obvious. We discussed my poor decision and what we had learned from the experience.

When a rule is set in a brief, follow it. It is much easier to realize after a flight that limits set in a brief were too stringent than to realize that changing them in the air was a poor decision. I had briefed that we would not push "it"—the fuel state. Even with no problems, we would probably have landed with only about 100 pounds above min fuel. That's not much, even in a T-2, especially at a strange field, at night, with a known gear problem.

Having a designated naval aviator rather than an student naval aviator in the front seat, combined with my overzealousness to get an extra approach, had contributed to my poor decision. In any training flight, the creed is always, "No mission is so important that safety must be compromised." Many times, I had seen other instructors push limits, usually weather, to complete hops. I always thought that violated our creed. After this hop, I decided that I too had violated the creed of good sense.

My decision process was also flawed in part from overconfidence. Yes, I did have enough hours in the airplane to be very familiar with it, and I had seen this happen before. I had not, however, ever seen the gear take 15 to 20 seconds to come down and hang up at 45 degrees. Since this was something I had not seen, my experience meant little.

I also felt I would be reassured that I had made a good decision if the landing gear came down and locked normally the second time. This, too, was poor headwork. Betting on a malfunction to fix itself is never a good proposition. I realized after the flight that even if the gear had come down normally the second time, that I would still have made an incorrect decision. ◀

Lt. Rollins is a CAT 1 A-6 pilot with VA-52. At the time of this incident, he was an instructor pilot with VT-19.

Vultures' Row

This list includes Flight, Flight-Related and Ground Class A Mishaps during FY-94.
Classifications and descriptions are subject to change.

DATE	AIRCRAFT	COMMAND	DAY; NIGHT	FATAL	FLIGHT REGIME; LOCATION
7 Oct	UH-1N	HMM-163	N	1	Takeoff; at sea
14 Oct	UH-1N	HMM-268	N	0	Towing, aircraft fell overboard (AGM); at sea
15 Oct	AV-8B	VMA-231	D	0	Birdstrike during low-level; Raleigh, NC
29 Oct	F/A-18D	VFA-106	D	0	Aborted takeoff; Whiting Field, FL
18 Nov	F-14A	VF-84	D	0	Training flight; Currituck Sound, NC
17 Dec	F/A-18A	VMFA-115	D	1	Air-to-air intercept; at sea
10 Jan	HH-46D	HC-6	N	3	Amphibious SAR support; at sea

1993 approach

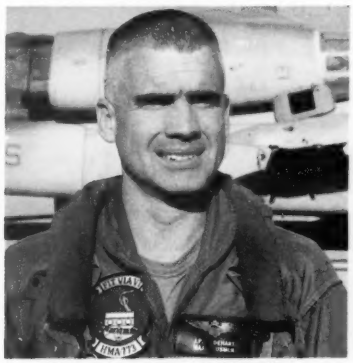
Contributor Awards

We are pleased to announce the winners of the *Approach* Contributor Awards for 1993. Contributions over the past year have been exceptional, and choosing winners in each category was difficult. All the authors and photographers who were publised contributed to the success of the magazine and to aviation safety.

Thanks to everyone who took the time to write an article or shoot a photo, and send them to us, even if we couldn't use or find a spot for them. The Naval Safety Center and *Approach* congratulate this year's winners.

Lt. Steve Halsted, Editor

Command Writing Award
HSL-34
Honorable Mention
HSL-48



Contributor of the Year
(Second Consecutive Year)
Maj. John P. Dehart, USMCR
HMA-773

Article of the Year
LCdr. Tom Ganse
"The End of Hopes and Dreams" (August)
VFA-113
Honorable Mention
"Watch the Deck! Roll Left!"
LCdr. Keith Menz, VF-142

Photographer of the Year
Fleet Imaging Command, Atlantic